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United States Patent [19]

Murphy

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[54] **PLASMA-BASED PLATELET
CONCENTRATE PREPARATIONS WITH
ADDITIVE**

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Related U.S. Application Data

[63] Continuation-in-part of Ser. No. 43,574, Apr. 7, 1993, Pat. No. 5,344,752, which is a continuation-in-part of Ser. No. 784,695, Oct. 30, 1991, Pat. No. 5,234,808.

[51] **Int. Cl.⁶** **A01N 1/02**

[52] **U.S. Cl.** **435/2; 424/532**

[58] **Field of Search** **435/2; 424/532**

[56] References Cited

U.S. PATENT DOCUMENTS

Re. 32,874	2/1989	Rock et al.	424/101
4,447,415	5/1984	Rock et al.	424/101
4,529,705	7/1985	Larsen	436/17
4,695,460	9/1987	Holme	424/101
4,769,318	9/1988	Hamasaki et al.	435/2
4,828,976	5/1989	Murphy	435/2
4,831,117	5/1989	Uckun	530/387
4,880,786	11/1989	Sasakawa et al.	514/53
4,992,363	2/1991	Murphy	435/2
4,994,367	2/1991	Bode et al.	435/2

OTHER PUBLICATIONS

Cesar, Diminno, Alam, Silver and Murphy in "Plasma Free Fatty Acid Metabolism During Storage of Platelet Concentrates for Transfusion", *Transfusion*, 27(5):434-437 (1987).

Guppy et al., *Vox Sanguinis*, 59:146-152 (1990).

Heaton et al., *British Journal of Hematology*, 75:400-407 (1990).

Kilkson, Holme and Murphy in "Platelet Metabolism During Storage of Platelet Concentrates at 22° C." *Blood*, 64(2):406-414.

Mollison, P. L., *Blood Transfusion in Clinical Medicine*, 7th Edition, Blackwell, 1983.

Murphy et al. in "Improved Storage of Platelets for Transfusion in a New Container", *Blood* 60(1):194-200 Jul., (1982).

Murphy in "The Preparation and Storage of Platelets for Transfusion", Mammon, Barnhart, Lusher and Walsh, PJD Publications, Ltd., Westbury, New York (1980).

Murphy in "Platelet Transfusion", *Progress in Hemostasis and Thrombosis*, vol. III, Edited by Theodore Spaet, Grune and Stratton, Inc. (1976).

Murphy et al. in "Platelets Storage at 22° C.: Role of Gas Transport Across Plastic Containers in Maintenance of Viability", *Blood* 46(2):209-218 (1975).

Murphy in "Platelet Storage for Transfusion", *Seminars in Hematology*, 23(3):165-177, (1985).

Simon, Nelson, Carmen and Murphy in "Extension of Platelet Concentrate Storage", *Transfusion*, 23:207-212, (1983).

Fijnheer, et al., In vitro Evaluation of Buffy-Coat-Derived Platelet Concentrates Stored in a Synthetic Medium, *Vox Sang.*, 60:16-22, (1991).

Adams, et al., Survival and Recovery of Human Platelets Stored for Five Days in a Non-Plasma Medium, *Blood*, 67:672-675, (1986).

Huang E. M. et al, *Thrombosis Research* 36:1-8 (1984).

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[57] ABSTRACT

The present invention provides a composition and method for improving the storage of platelets and optimizing the viability of stored platelets. The present invention allows platelets to be stored in plasma for extended periods, without the addition of buffer, by adding storage extension additives, which include acetate, pyruvate, acetoacetate, β -hydroxybutyrate, acetone, α -ketoglutarate, succinate, fumarate, malate, oxaloacetate, C₃₋₈ fatty acid anions, triose phosphates and mixtures thereof, to a platelet concentrate.

20 Claims, 10 Drawing Sheets